## **CLAIMS**

What is claimed is:

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- A method of treating emphysema in a mammal comprising administering to a mammal in need of such treatment a therapeutically effective amount of 13-cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof.
- The method of Claim 1, wherein the therapeutically effective amount of 13-2. cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 0.1 ug and about 10.0 mg.
- The method of Claim 2, wherein the therapeutically effective amount of 13-3. cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 1.0 µg and about 1.0 mg.
- The method of Claim 3, wherein the therapeutically effective amount of 13-4. cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 5.0 μg and about 15.0 μg.
- The method of Claim 3, wherein the therapeutically effective amount of 13-5. cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 100.0 µg and about 300.0 µg.
- The method of Claim 1, wherein the therapeutically effective amount of 13cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, repairs alveoli in the mammal.
  - The method of Claim 1, wherein the mammal is human. 7.
  - The method of Claim 7, wherein the human was or is a cigarette smoker. 8.
- The method of Claim 1, wherein the emphysema is panlobar emphysema, 9. centrilobular emphysema or distal lobular emphysema.
- The method of Claim 1, wherein the therapeutically effective amount of 13-35 10. cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is administered with an electrohydrodynamic aerosol device.

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A pharmaceutical composition suitable for treating a mammal suffering from emphysema comprising an amount of 13-cis-retinoic acid or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, and a pharmaceutically acceptable carrier, said amount being sufficient to alleviate one symptom of emphysema.

- 12. The pharmaceutical composition of Claim 11, wherein the pharmaceutically acceptable carrier is suitable for electrohydrodynamic aerosol device, a aerosol device or a nebulizer device.
- 13. The pharmaceutical composition of Claim 11, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 0.1 µg and about 10.0 mg.
- 14. The pharmaceutical composition of Claim 13, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 1.0 µg and about 1.0 mg.
- 15. The pharmaceutical composition of Claim 14, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 100.0  $\mu$ g and about 300.0  $\mu$ g.
- 16. The pharmaceutical composition of Claim 12, wherein the pharmaceutically acceptable carrier is a liquid.
- 17. The pharmaceutical composition of Claim 16, wherein the pharmaceutically acceptable carrier is chosen from the group consisting of water, alcohol, polyethylene glycol and perfluorocarbon.
- 18. The pharmaceutical composition of Claim 16, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 1.0 μg and about 100.0 μg.
- 19. The pharmaceutical composition of Claim 18, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 3.0  $\mu$ g and about 30.0  $\mu$ g.

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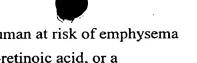
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- 20. The pharmaceutical composition of Claim 19, wherein the amount of 13-cisretinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, is between about 5.0 μg and about 15.0 μg.
  - 21. The method of Claim 9, wherein the mammal is human.
  - 22. The method of Claim 21, wherein the human was or is a cigarette smoker.
- 23. The method of Claim 11, wherein the emphysema is panlobar emphysema, centrilobular emphysema or distal lobular emphysema.
- 24. A method for treating emphysema and related disorders comprising delivering a formulation of 13-cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, into the lungs of a mammal.
- 25. The method of Claim 24, wherein the emphysema is panlobar emphysema, centrilobular emphysema or distal lobular emphysema
  - 26. The method of Claim 24, wherein the mammal is human.
  - 27. The method of Claim 26, wherein the human was or is a cigarette smoker.
- 28. The method of Claim 24, wherein the formulation is delivered into the lungs of the mammal with a nebulizer device.
- 29. The method of Claim 24, wherein the formulation is delivered into the lungs of the mammal with a aerosol device.
- 30. The method of Claim 24, wherein the formulation is delivered into the lungs of the mammal with a electrohydrodynamic aerosol device.
- 31. A method for treating emphysema comprising combining the use of 13-cisretinoic acid with one or more additional therapies.
- 32. The method of Claim 31, wherein the additional therapies are chosen from the group consisting of smoking cessation, bronchodilators, antibiotics and oxygen therapy.



- A method for preventing emphysema in a human at risk of emphysema 33. comprising administering to the human a amount of 13-cis-retinoic acid, or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof, said amount being sufficient to prevent emphysema.
  - The method of Claim 33, wherein the human was or is a cigarette smoker. 34.
- A pharmaceutical composition suitable for preventing emphysema in a human 35. at risk of emphysema comprising an amount of 13-cis-retinoic acid or a pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof and a pharmaceutically acceptable carrier, said amount being sufficient to prevent emphysema.